

A taxonomic revision of *Austrobuxus* Miq. (Euphorbiaceae: Dissiliariinae) in Australia

Paul I. Forster

Summary

Forster, Paul I. (1997). A taxonomic revision of *Austrobuxus* Miq. (Euphorbiaceae: Dissiliariinae) in Australia. *Austrobaileya* 4(4): 619–626. The genus *Austrobuxus* Miq. in Australia is revised. Two species are recognised, *A. swainii* (Beuzev. & C.T.White) Airy Shaw and *A. megacarpus* P.I.Forst., sp. nov. The name *A. nitidus* Miq. has been misapplied to *A. megacarpus*.

Keywords: *Austrobuxus megacarpus*; *Austrobuxus nitidus*; *Austrobuxus swainii*; Euphorbiaceae; Australia; Malesia.

Paul I. Forster, Queensland Herbarium, Meiers Road, Indooroopilly Queensland 4068, Australia

Introduction

The genus *Austrobuxus* was described by Miquel (1861) and based on the Malesian species *A. nitidus* Miq. Taxa of *Austrobuxus* have been found subsequently elsewhere in Malesia, Australia and Melanesia, with the greatest concentration of taxa present in New Caledonia (Airy Shaw 1971, 1974; Smith 1981; McPherson & Tirel 1987). Plants of this genus are dioecious trees or rarely shrubs. *Austrobuxus* was included both by Levin & Simpson (1994) and Webster (1994) in Euphorbiaceae subfamily Oldfieldioideae Köhler & Webster, tribe Caletieae Müll. Arg., subtribe Dissiliariinae Pax & Hoffm., together with *Canaca* Guillaumin (included within *Austrobuxus* by Levin and Simpson (1994)), *Choriceras* Baill., *Dissiliaria* F. Muell. ex Baill., *Longetia* Baill. and *Whyanbeelia* Airy Shaw & B. Hyland. This subtribe also includes *Sankowskya* P.I. Forst. (Forster 1995).

A macromorphological comparison of *Austrobuxus* with the other genera in the subtribe has been given by Forster (1995). *Austrobuxus* is distinctive within the Dissiliariinae most notably by the conspicuous arilloid caruncle on its seed. Levin & Simpson (1994) performed a number of cladistic analyses of *Austrobuxus*, *Choriceras*, *Dissiliaria*, *Longetia* and

Whyanbeelia based on palynological, vegetative and reproductive characters and found that *Austrobuxus* was most closely related to *Dissiliaria* within the Dissiliariinae.

The current distribution of the extant species of *Austrobuxus* indicates that the genus is of ancient origin with the extant species found in rainforest refugia (Australia, New Caledonia, New Guinea) or derived habitats (e.g. ultramafic soils in Malesia and New Caledonia) (Airy Shaw 1971, 1974; McPherson & Tirel 1987). The genus was undoubtedly more widespread in Australia as some fossil Euphorbiaceous pollen from tertiary deposits in south-east Australia is thought to belong to the genus (Martin 1974).

The first Australian species described that is now referable to *Austrobuxus* is that by de Beuzeville and White (1946) as *Longetia swainii* from north-eastern New South Wales material. *Longetia* was subsequently restricted in its circumscription to the single species *L. buxoides*, which is endemic in New Caledonia (Airy Shaw 1971; McPherson & Tirel 1987), by transfer of *L. swainii* to *Austrobuxus* by Airy Shaw (1971). A second species, referred to as *A. nitidus*, was later added to the Australian flora by Airy Shaw (1980) with the comment 'I cannot distinguish this plant from narrow-leaved forms of the common *A. nitidus* of Malaya, Sumatra and Borneo. The disjunction in distribution of nearly

3840 km between East Indonesian Borneo, the nearest otherwise known locality, and this North Queensland population is remarkable'. Airy Shaw (1981) subsequently provided descriptions of both taxa for his conspectus of Australian Euphorbiaceae; however, much of his descriptive detail for '*A. nitidus*' appears to be based on Malesian collections. The north-east Queensland populations of *Austrobuxus* are not conspecific with *A. nitidus* and are described as a new species in this paper.

Materials and methods

This revision is based on herbarium material in AD, BO, BRI, CANB, CBG, L, MEL, NSW and QRS, and field observations and collections by the author.

Indumentum cover is described herein using the terminology of Hewson (1988), except that 'scattered' is preferred to 'isolated'.

Common abbreviations in the specimen citations are N.P. (National Park), L.A. (Logging Area), S.F. or S.F.R. (State Forest or State Forest Reserve) and T.R. (Timber Reserve). AQ numbers refer to the computerised collection number situated on the sheet and/or the label of specimens housed in the Queensland Herbarium (BRI).

Rainforest terminology follows Webb (1978). The 'Wet Tropics' is defined as that part of north-eastern Queensland which encompasses the 'hot, humid vine forests' from near Cooktown in the north to Paluma in the south (Webb & Tracey 1981; Barlow & Hyland 1988).

Taxonomy

Austrobuxus Miq., Fl. Ind. Bat. Suppl. 444 (1861). **Type:** *A. nitidus* Miq.

Derivation of name: From the Latin *Austro* and *buxus* meaning southern box.

Shrubs or trees, dioecious, evergreen, perennial; stems and foliage without latex. Indumentum of simple, multicellular trichomes; glandular trichomes absent; stinging trichomes absent. Stipules entire, small or ± obsolete, deciduous. Leaves opposite or alternate, petiolate, elobate, penninerved; margins entire or rarely denticulate to crenulate. Inflorescences axillary, racemose, solitary, unisexual with flowers in bracteate clusters. Female flowers pedicellate; sepals imbricate, 2+2 or 3+3; petals absent; disk shortly cupular or obsolete; ovary 2- or 3-locular, with loculi biovulate or rarely uniovulate; styles 2 or 3, subsessile, ovate-subulate, transversely reniform or linear-subulate, usually free. Male flowers pedicellate; sepals imbricate, 2+2 or 3+3; petals absent; receptacle convex; stamens 2–25, with filaments free and arising from pits in the receptacle; anthers dorsifixed, bilobate, with thecae oblong, longitudinally dehiscent; pistillodes absent. Fruits capsular, 2- or 3-locular, smooth, dehiscent into bivalved cocci. Seeds obloid or ovoid; testa crustaceous; albumen fleshy; caruncle conspicuously arillate; cotyledons broad, flat.

A genus of 22 species occurring in Malesia (4 species), Melanesia (16 species) and Australia (2 species). Both Australian species are endemic.

Key to the Australian species of *Austrobuxus*

1. Leaves elliptic or cuneate-obovate, entire; ovary and capsule 3-locular; seed with red aril. **2. *A. megacarpus***
 Leaves narrow-elliptic to lanceolate, crenulate-dentate; ovary and capsule 2-locular; seed with yellow aril **1. *A. swainii***

1. *Austrobuxus swainii* (Beuzev. & C.T.White)
 Airy Shaw, Kew Bull. 25: 508 (1971);
Longetia swainii Beuzev. & C.T.White,
 Proc. Linn. Soc. N.S.W. 71: 236 (1946).
Type: New South Wales. East Dorrigo,

Mar 1944, *Rosling* s.n. (holo: ?SYD [not found]; iso: BRI).

Illustrations: de Beuzeville & White (1946: 237); Floyd (1989: 136).

Tree up to 40 m high, but often much smaller. Indumentum of simple, ferruginous-brown trichomes. Trunk flanged, slightly buttressed at base; bark grey to brown, scaly, shedding in patches; blaze bright pink to red. Branchlets \pm rounded, with dense trichomes when young, glabrescent. Stipules absent. Leaves petiolate; petioles 7–8 mm long, c. 1.5 mm wide, with dense trichomes when young, glabrescent; lamina lanceolate to narrow-elliptic, 25–130 mm long, 12–40 mm wide, discolorous, with venation comprising 13–15 lateral veins per side of midrib and reticulate tertiary veins; margins denticulate to weakly crenate with 30–40 minute teeth per side of midrib; tip acute or obtuse; base cuneate; upper surface dark glossy green, glabrous, with venation obscure; lower surface pale green, glabrous, with venation prominent. Male inflorescences axillary, up to 30 mm long; peduncle up to 7 mm long, with dense trichomes; bracts triangular, 0.6–1 mm long, c. 0.4 mm wide, with dense trichomes. Male flowers 2.5–3 mm long, 5–7 mm wide; pedicels 1.6–3 mm long, c. 0.4 mm diameter, with sparse trichomes; sepals 2+2, \pm orbicular, 2–2.3 mm long, 1.8–2 mm wide, glabrous; receptacle c. 0.8 mm long and 1 mm diameter; stamens 9, with filaments 1.5–2.8 mm long, c. 0.1 mm diameter, glabrous; anthers c. 0.7 mm long and 0.5 mm wide. Female inflorescences up to 10 mm long; peduncle up to 3 mm long, with dense trichomes; bracts lanceolate, 1.5–2 mm long, 0.7–1 mm wide, with dense trichomes. Female flowers 3–4 mm long, c. 3 mm diameter; pedicels 1–1.5 mm long, c. 1 mm diameter, with dense trichomes; sepals 2+2, lanceolate-ovate, 1.5–2 mm long, 1.4–1.8 mm wide, with dense trichomes abaxially; ovary bilocular, 1.8–2 mm long, 1.2–2 mm diameter, with dense trichomes; styles 2, ovate-subulate, 1–1.8 mm long, 0.5–0.6 mm wide, entire, papillose on top and with dense trichomes on back. Fruits bilocular, ovoid, 9–15 mm long, 7–12 mm diameter. Seeds ovoid, 7–8 mm long, 4.5–6 mm wide, 2.8–3 mm thick, brown; caruncle ariloid, yellow.

Selected additional specimens examined: Queensland. MORETON DISTRICT: Tallebudgera Mt, Mar 1979, *McDonald* 2809 & *Whiteman* (BRI); Purlingbrook Falls, end of Carricks road, Aug 1990, *Catchpoole* [AQ473153] (BRI); Springbrook, Sep 1952, *Gresty* 1555 (BRI); Warrie N.P., Springbrook, Jun 1978, *McDonald* 2032 & *Jessup* (BRI);

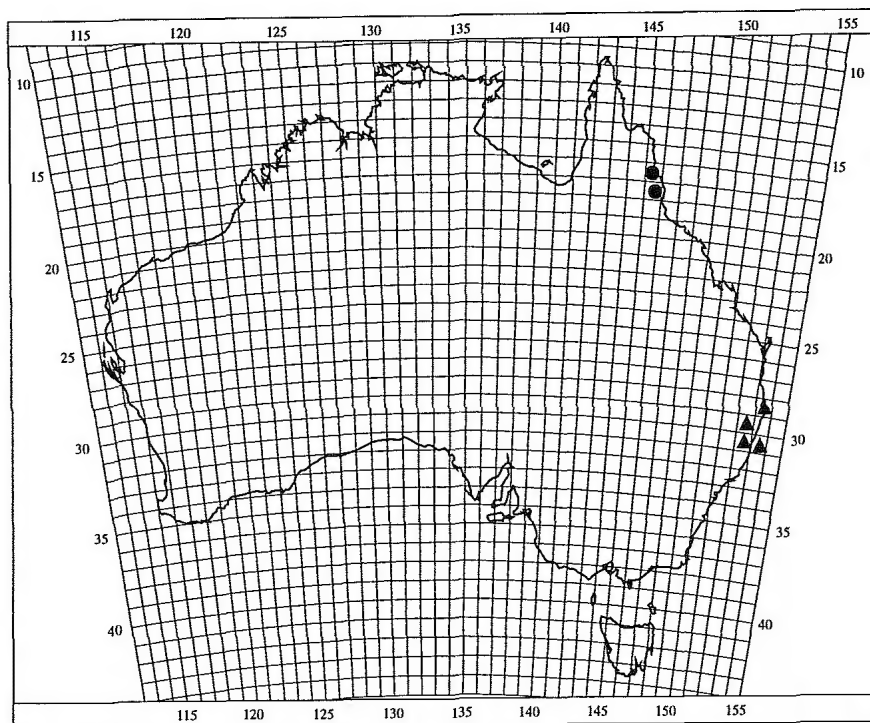
Banksia road, Springbrook, Sep 1993, *Forster* 13861 & *Leiper* (BRI, QRS); Mungora Creek, Springbrook N.P., Sep 1993, *Forster* 13860 & *Leiper* (BRI, QRS); below Panorama View estate, Springbrook, Sep 1993, *Forster* 13859 & *Leiper* (BRI); The Cougals, Springbrook N.P., Mt Cougal section, Oct 1994, *Forster* 15833 & *Leiper* (BRI, NSW). New South Wales. Terranora area, SW of Tweed Heads, May 1984, *Davidson* [AQ440566] (BRI); Terania Creek, 10 km NNE of The Shannon, Feb 1980, *Coveny* 10646 (BRI, NSW); Downfall Creek, Megan, Jan 1980, *Floyd* 1422 (BRI); Head of Wilson's Creek via Murwillumbah, Jun 1944, *Hayes* (BRI); Whian Whian S.F., Jun 1945, *White* 12785 (BRI); Dorriggo, Mar 1946, *King* [AQ201312] (BRI); ditto, Mar 1946, *Hewitt* [NSW137146] (BRI, NSW); Bellingen, Mar 1940, *Rickerby* [NSW155225] (NSW).

Distribution and habitat: *Austrobuxus swainii* is restricted to the area from Tallebudgera Creek in Queensland to Bellingen in New South Wales and occurs over four 1° grid squares (**Map 1**). Plants grow above 700 m altitude in warm temperate rainforests (notophyll vineforests, microphyll fern forest/thickets) or adjacent eucalypt forest, often in association with *Ceratopetalum apetalum* D. Don (coachwood).

Notes: This species first came to note in the 1940's when it was harvested for timber under the trade name of 'Pink Cherry' (De Beuzeville & White 1946), although other names such as 'Hairybark' and 'Pinkwood' have also been used (Floyd 1989).

Austrobuxus swainii is unique in the genus for its crenulate leaf margins, the consistently bilocular ovary and more or less linear styles. Toothed leaves are rare in Euphorbiaceae subtribe Dissiliariinae but also occur elsewhere in some species of *Choriceras*, *Dissiliaria* and *Sankowskyia* (Forster 1995). This character is thought to be plesiomorphic within Euphorbiaceae subfamily Oldfieldioideae (Hayden 1994).

The whereabouts of the holotype of this species name has not been ascertained. The specimen was stated by de Beuzeville and White (1946) to be deposited at the 'Herbarium, University of Sydney' (SYD). Enquiries to SYD revealed that most type collections had been donated to NSW after the retirement of R.C. Carolin; however, this particular type could not be located at either institution (A. Ford, pers. comm. Oct. 1993).



Map 1. Distribution of *Austrobuxus megacarpus* ● and *A. swainii* ▲.

Conservation status: *Austrobuxus swainii* is a rare tree in Queensland with few known localities of occurrence, nearly all of which are in the Springbrook area, and in New South Wales is known from 22 fragmented and disjunct localities (Floyd 1989). The species is present in Cougal and Warrie National Parks in Queensland (Thomas & McDonald 1989) and in the Dorrigo and Border Ranges National Parks in New South Wales (Floyd 1989).

The conservation coding of 3RC given by Briggs & Leigh (1988) and Thomas & McDonald (1989) appears appropriate.

2. *Austrobuxus megacarpus* P.I.Forst., sp. nov. affinis *A. nitido* Miq. a qua indumento hyalino usque flavo, floris masculini pedicello longiore (4.5–6 mm longo), sepalis 2 et 2 et majoribus (3–4 mm longis, 2–2.2 mm latis), fructu ovoideo et majore (18–23 mm longo, c. 18 mm diam.) et semine majore (c. 10 mm longo, 5–6 mm lato et c. 6 mm crasso), differt. **Typus:** Queensland. COOK DISTRICT: State Forest

Reserve 310, Bora Logging Area, 23 Jun 1982, B. Gray 2632 (holo: QRS; iso: BRI).

[*Austrobuxus nitidus* auct. non Miq.: Airy Shaw (1971: 506; 1980: 219; 1981: 597); Christophel & Hyland (1993); Hyland & Whiffin (1993)]

Illustration: Christophel & Hyland (1993: 98, Plate 36a) [as *A. nitidus*].

Small shrub or a tree up to 30 m high. Indumentum of simple, hyaline to yellow trichomes. Trunk gnarled, slightly fluted at base; bark brown, somewhat flaky; blaze pale pink. Branchlets ± rounded, glabrous. Stipules subulate, 1–1.3 mm long, c. 0.3 mm diameter, with scattered trichomes, deciduous. Leaves petiolate; petioles 4–10 mm long, 1–1.3 mm wide, glabrous; lamina cuneate-obovate to elliptic, 22–110 mm long, 10–36 mm wide, discolorous, with venation comprising 7–10 weakly developed lateral veins per side of midrib and reticulate tertiary veins; margins ± entire or weakly sinuate, often slightly revolute; tip acute or obtuse; base cuneate to almost attenuate;

upper surface dark green, glabrous, with venation \pm obscure; lower surface pale green, glabrous, with venation visible but not prominent. Male inflorescences axillary, up to 40 mm long; peduncle up to 5 mm long, with scattered trichomes; bracts lanceolate, 0.8–1.8 mm long, 0.4–0.6 mm wide, with scattered trichomes. Male flowers 3–4 mm long, 4–5.5 mm wide; pedicels 4.5–8 mm long, 0.3–0.5 mm diameter, with scattered trichomes; sepals 2+2, narrow-ovate to suborbicular, 3–4 mm long, 2–2.2 mm wide, glabrous; receptacle raised-convex, c. 1.6 mm long and 2 mm diameter, glabrous; stamens 7–9, with filaments 1.7–2.2 mm long, c. 0.2 mm diameter, glabrous; anthers 1–1.8 mm long and 0.9–1.1 mm wide. Female inflorescences up to 15 mm long; peduncle up to 4 mm long, with scattered trichomes; bracts lanceolate, 1.8–2 mm long, 1–1.2 mm wide, with scattered trichomes. Female flowers 3–3.5 mm long, 2.5–3 mm diameter; pedicels 2–5 mm long, 1.5–1.8 mm diameter, with scattered trichomes; sepals 2+2, ovate, 2–2.5 mm long, 2–2.2 mm wide, glabrous; ovary trilobular, 2–3 mm long, 2–3.5 mm diameter, glabrous; styles 3, subsessile, transversely reniform, 1.4–1.5 mm long, 1.2–1.3 mm wide, entire, papillose on top, glabrous or with occasional scattered trichomes abaxially. Fruit trilobular, ovoid, 18–23 mm long, c. 18 mm diameter. Seed ovoid, c. 10 mm long, 5–6 mm wide and c. 6 mm thick, red-brown; caruncle arilloid, red. **Fig. 1.**

Selected additional specimens examined: Queensland. COOK DISTRICT: S.F.R. 143, North Mary L.A., Jul 1988, Gray 4899 (BRI, QRS); ditto, Mar 1984, Hyland 12936 (BRI, QRS); ditto, Dec 1982, Gray 2874 (BRI, QRS); Mt Lewis road, Jan 1987, Jessup 285 & Clarkson (BRI, CANB, NSW); ditto, Aug 1957, Smith 10095 (BRI); ditto, Jul 1994, Forster 15634 et al. (BRI, MEL); Forest Reserve. 755, North Johnstone L.A., Jun 1966, Dansie 4007 (BRI); S.F.R. 310, Sep 1973, Dansie s.n. (QRS); S.F.R. 310, Bora L.A., Oct 1973, Hyland 6917 (QRS); ditto, Oct 1973, Hyland 6918 (QRS); Swipers L.A., Jun 1972, Risley 59 (QRS).

Distribution and habitat: *Austrobuxus megacarpus* is endemic in the 'Wet Tropics' of north-east Queensland where it has been collected in the Mt Lewis area and west of Babinda (**Map 1**). Plants grow on ridgetops from 750 to 1150 m altitude in simple microphyll fern-moss thicket or simple microphyll vineforest on soils derived from granite.

Notes: Airy Shaw (1980, 1981) considered that this plant was conspecific with *Austrobuxus nitidus* from the Malay Peninsula, Borneo and Sumatra. This view is understandable as the two taxa are superficially similar and little fertile material of the Australian plant was available to Airy Shaw at the time. Subsequent collections of fertile material of the Australian plant by B.Gray and B.Hyland (QRS) have revealed numerous differences from the Malesian plants. These differences are summarised in **Table 1**. Bibliographic and voucher details for *A. nitidus* are given in **Appendix 1**.

Table 1. Morphological comparison between *Austrobuxus nitidus* and *A. megacarpus*.

Character	<i>A. nitidus</i>	<i>A. megacarpus</i>
Indumentum colour	ferruginous-brown	hyaline to yellow
Male flower pedicel length (mm)	2.5–3	4.5–6
Male flower sepals	3+3	2+2
Male flower sepal size (mm)	1.8–2 \times 1.7–2	3–4 \times 2–2.2
fruit shape & size (mm)	obovoid, 7–16 \times 7–12	ovoid, 18–23 \times c. 18
seed size (mm)	6–8.5 \times 2.5–4 \times 4.5–5	c. 10 \times 5–6 \times 6

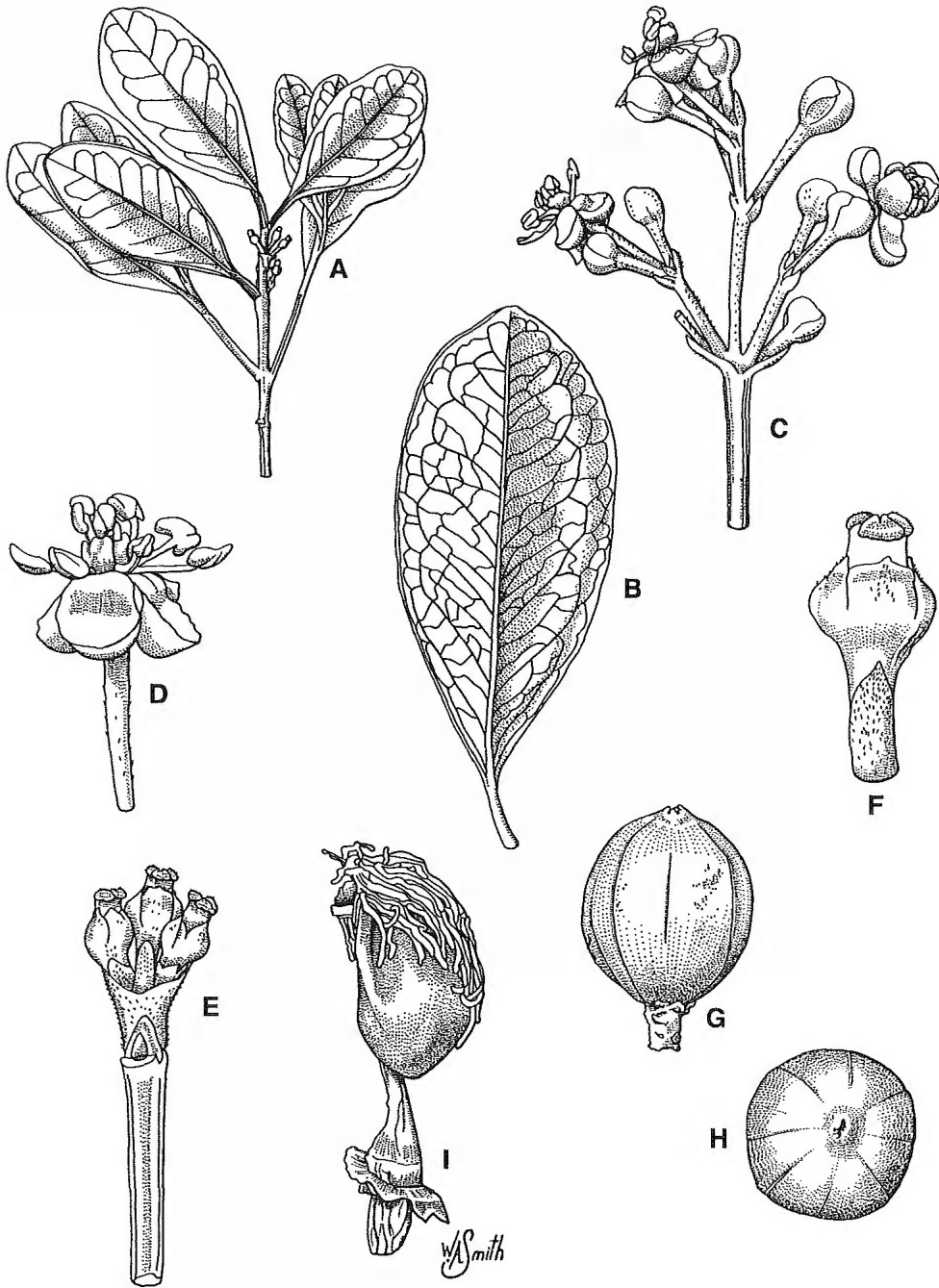


Fig. 1. *Austrobuxus megacarpus*. A. twig with female inflorescence $\times 0.5$. B. lower leaf surface showing venation $\times 1$. C. male inflorescence $\times 10$. D. male flower $\times 20$. E. female inflorescence $\times 10$. F. female flower $\times 20$. G. lateral view of fruit $\times 4$. H. apical view of fruit $\times 4$. I. single seed attached to central columella of fruit and with caruncle covering upper portion $\times 10$. A, B, G–I from *Hyland* 12936 (BRI, QRS); C, D from *Gray* 2632 (QRS); E, F from *Hyland* 13521 (QRS). Del. W. Smith.

Conservation status: *Austrobuxus megacarpus* is a rarely collected plant with a restricted distribution. The known localities where it occurs are not under any immediate threat; however, the Conservation Coding of 2R given for this species (as *A. nitidus*) by Briggs & Leigh (1988) and Thomas & McDonald (1989) is probably justifiable pending further survey.

Etymology: The specific epithet is from Greek *mega* (large) and *carpos* (fruit) and alludes to the much larger fruit of this species in comparison with those of *A. nitidus* and *A. swainii*.

Acknowledgements

W. Smith (BRI) provided the drawings. Field assistance when collections of *Austrobuxus* were made was provided by G. Leiper, G. & N. Sankowsky and M. C. Tucker. The Directors/Curators of the cited herbaria allowed access to collections in their care, either in situ or on loan. Translation of the diagnosis into Latin was kindly undertaken by L. A. Craven (CANB). Comments on a draft of the manuscript were provided by A. R. Bean (BRI). This work was funded by the Australian Biological Resources Study (ABRS) as a preferred objective research project in 1992–1994. A grant from the Wet Tropics Management Agency for the project 'Rare and Endangered Euphorbiaceae of the Wet Tropics' enabled extended time in the 'Wet Tropics' and at QRS. Access to State Forests and Timber Reserves was facilitated by relevant permits from the Queensland Forest Service, Department of Primary Industries.

References

- AIRY SHAW, H.K. (1971). Notes on Malesian and other Asiatic Euphorbiaceae. *Kew Bulletin* 25: 473–553.
- (1974). Notes on Malesian and other Asiatic Euphorbiaceae. *Kew Bulletin* 29: 281–331.
- (1980). New or noteworthy Australian Euphorbiaceae - II. *Muelleria* 4: 207–241.
- (1981). A partial synopsis of the Euphorbiaceae-Platyloboae of Australia (excluding *Phyllanthus*, *Euphorbia* and *Calycopeplus*). *Kew Bulletin* 35: 577–700.
- BARLOW, B.A. & HYLAND, B.P.M. (1988). The origins of the flora of Australia's wet tropics. *Proceedings of the Ecological Society of Australia* 15: 1–17.
- BRIGGS, J.D. & LEIGH, J.H. (1988). *Rare or Threatened Australian Plants. Revised Edition*. Australian National Parks and Wildlife Service Special Publication No. 14. Canberra: Australian National Parks & Wildlife Service.
- CHRISTOPHEL, D.C. & HYLAND, B.P.M. (1993). *Leaf Atlas of Australian Tropical Rain Forest Trees*. Melbourne: CSIRO Publications.
- DE BEUZEVILLE, W.A.W. & WHITE, C.T. (1946). A new species of *Longetia*: the botanical identity of the "Pink Cherry" of Dorriggo timber-getters. *Proceedings of the Linnean Society of New South Wales* 71: 236–238.
- FLOYD, A.G. (1989). *Rainforest Trees of South-eastern Australia*. Melbourne & Sydney: Inkata Press.
- FORSTER, P.I. (1995). *Sankowskya*, a new genus of Euphorbiaceae (Dissiliariinae) from the Australian Wet Tropics. *Austrobaileya* 4: 329–335.
- HAYDEN, W.J. (1994). Systematic anatomy of Euphorbiaceae subfamily Oldfieldioideae. I. Overview. *Annals of the Missouri Botanical Garden* 81: 180–202.
- HEWSON, H. (1988). *Plant Indumentum. A Handbook of Terminology*. Australian Flora and Fauna Series No. 9. Canberra: Australian Government Publishing Service.
- HYLAND, B.P.M. & WHIFFIN, T. (1993). *Australian Tropical Rain Forest Trees: An Interactive Identification System*. Melbourne: CSIRO Publications.
- LEVIN, G.A. & SIMPSON, M.G. (1994). Phylogenetic implications of pollen ultrastructure in the Oldfieldioideae (Euphorbiaceae). *Annals of the Missouri Botanical Garden* 81: 203–238.
- MARTIN, H.A. (1974). The identification of some Tertiary Pollen belonging to the family Euphorbiaceae. *Australian Journal of Botany* 22: 271–291.
- MCPHERSON, G. & TIREL, C. (1987). Euphorbiaceae I. Euphorbioideae, Crotonoideae, Acalyphoideae, Oldfieldioideae. *Flore de la Nouvelle-Calédonie et Dépendances. 14*. Paris: Muséum National d'Histoire Naturelle.
- MIQUEL, F.A.W. (1861). *Flora Indiae Batavae. Supplementum I. Prodronus Florae Sumatranae*. Amsterdam: C.G. van der Post.
- SMITH, A.C. (1981). Euphorbiaceae. *Flora Vitiensis Nova* 2: 439–575. Lawai, Hawaii: Pacific Tropical Botanical Garden.

- THOMAS, M.B. & McDONALD, W.J.F. (1989). *Rare and Threatened Plants of Queensland*. 2nd Edition. Brisbane: Queensland Department of Primary Industries.
- WEBB, L.J. (1978). A general classification of Australian rainforests. *Australian Plants* 9: 349–363.
- WEBB, L.J. & TRACEY, J.G. (1981). Australian rainforests: pattern and change. In A. Keast (ed.), *Ecological Biogeography of Australia*. pp. 605–94. The Hague: W. Junk.
- WEBSTER, G.L. (1994). Synopsis of the genera and suprageneric taxa of Euphorbiaceae. *Annals of the Missouri Botanical Garden* 81: 33–144.

Appendix 1. *Austrobuxus nitidus*: Bibliographic data and Selected Specimens Examined

Austrobuxus nitidus Miq., Fl. Ind. Bat., Suppl. 445 (1861); *Longetia nitida* (Miq.) Steenis, Blumea 12: 362 (1964). **Type:** Sumatra. “W.K. Sumatra, ad litt. Sibogae....769 HB” [L963240581] (iso: L).

Choriophyllum malayanum Benth., Hook. Icon. Pl. 13: 62, t. 1280 (1879); *Longetia malayana* (Benth.) Pax & K. Hoffm. in Engl., Pflanzenr. 15: 292 (1922). **Type:** Borneo. Sarawak, *Beccari* 3329 (lecto: K n.v., fide Airy Shaw (1981: 597).

Selected specimens examined: Malaysia. Penang Hill, tunnel road, May 1938, *Henderson* [SING21440] (BRI); Gunung Jerah, Kedah, Feb 1973, *Shukor* 58 (BRI); Gombak Forest Reserve, Selangor, Nov 1981, *Saleh* [FRI28793] (BRI). Sumatra. Mt Sago near Pajakumbuh, Jun 1957, *Meijer* 5889 (L); Bengkalis Tamansari, Aug 1919, *Beguïn* 264 (L); Res. Tapiannoeli and. afd. Padang Lawas, Jan 1923, *Beumée* 1924 (L); Banka, Aug 1864, *Berkhout* 981 (L); [unlocalised] *Korthals* [L90954117] (L.). Sulawesi (Celebes). Batu Besi between Tabarano & Larona River, Jul ?, *van Balgooy* 4089 (BRI).